UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte SRINIVAS GUTTA and KAUSHAL KURAPATI

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Appeal 2008-4366
Application 10/014,192
Technology Center 2400

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Decided: August 10, 2009

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Before MICHAEL R. FLEMING, *Chief Administrative Patent Judge,*
ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge,* and
KENNETH W. HAIRSTON, SCOTT R. BOALICK, and JOHN A.
JEFFERY, *Administrative Patent Judges.*

PER CURIAM.

DECISION ON APPEAL

SUMMARY OF THE DECISION

We affirm-in-part and enter new grounds of rejection under 37 C.F.R.

§ 41.50(b). We affirm the Examiner's rejection under 35 U.S.C. § 101 of

(1) method claims 1, 3-9, 11-13, and 21-23; (2) system claims 14 and 16-18;

and (3) article of manufacture claim 19.

Although we find that claims 14 and 19 are on their face directed to

the "machine" or "manufacture" category of patent-eligible subject matter in

Section 101, we conclude that claim 14, its dependent claims 16-18, and

claim 19 are nonetheless nonstatutory. We reach our conclusion that claims

14-19 are nonstatutory based on the following two-part inquiry to determine

whether the scope of the claimed invention encompasses one of the

judicially-created exceptions:

> For a claimed machine (or article of manufacture)[1] involving a
> mathematical algorithm,
>
> (1) Is the claim limited to a tangible practical application, in
> which the mathematical algorithm is applied, that results in a
> real-world[2] use[3] (e.g., "not a mere field-of-use label having no
> significance")?[4]

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[1] Notwithstanding the court's statement in *In re Nuijten*, 500 F.3d 1346,
1356 n.7 (Fed. Cir. 2007) ("We have never held that a *manufacture* is ever
required to produce any result."), if an applicant chooses to claim the
manufacture in terms of applying a mathematical algorithm (e.g.,
Appellants' claim 19), then this two-part inquiry applies to determine if the
claim is directed to eligible subject matter under § 101.
[2] "Real-world" is not sufficient alone to establish patent-eligible subject
matter absent tangibility. *See In re Nuijten*, 500 F.3d at 1356.

(2) Is the claim limited so as to not encompass substantially all practical applications of the mathematical algorithm[5] either "in all fields" of use of the algorithm or even in "only one field?"[6]

If the machine (or article of manufacture) claim fails either prong of the two-part inquiry, then the claim is not directed to patent eligible subject matter.

We designate our rationale for rejecting claims 14 and 16-19 under § 101 as a new ground of rejection.

In addition to this new ground of rejection, we reverse the Examiner's rejection of claim 20 under 35 U.S.C. § 101, and enter a new ground of rejection for system claim 20 under 35 U.S.C. § 112, second paragraph on the same basis set forth in *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008).

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[3] *See Gottschalk v. Benson*, 409 U.S. 63, 68 (1972) (noting that the claim at issue was "so abstract and sweeping as to cover both known and unknown uses . . . .").

[4] *See In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc) (noting that the claim's recitation of "a rasterizer for creating a smooth waveform is not a mere field-of-use label having no significance.").

[5] *Benson*, 409 U.S. at 71-72.

[6] *See In re Bilski*, 545 F.3d 943, 957 (Fed. Cir. 2008) (en banc), *cert. granted*, 77 U.S.L.W. 3442, 3653, 3656 (U.S. June 1, 2009) (No. 08-964) (citing *Diamond v. Diehr*, 450 U.S. 175, 193 n.14 (1981)) ("[I]neligibility under § 101 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.'").

We do not reach the question of whether the Examiner's rejection of claims 1, 3-7, 9, 11, 12, 14, 16, 17, and 19-23 under 35 U.S.C. § 102(b) as being anticipated by Chislenko is in error.

We also do not reach the question of whether the Examiner's rejection of claims 8, 13, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Chislenko and Keyes is in error.

The new grounds of rejection in this decision are pursuant to our authority under 37 C.F.R. § 41.50(b). The rule is permissive and merely provides the Board the option of making a new ground of rejection. Manual of Patent Examining Procedure (MPEP) § 1213.02 (8th ed., rev. 3 Aug. 2005). Making a new ground of rejection is therefore an exercise of discretion made solely at the option of the panel and is not a mandatory requirement. *See id.* Thus, in the opinion that follows, we have chosen to enter only selected new grounds of rejection.

STATEMENT OF THE CASE [7]

Appellants appeal the Examiner's rejection of claims 1, 3-9, 11-14, and 16-23 under 35 U.S.C. § 134(a). Claims 2, 10, and 15 are canceled. App. Br. 2. We have jurisdiction under 35 U.S.C. § 6(b).

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[7] Throughout this opinion, we refer to: (1) the Appeal Brief filed August 6, 2007 ("the Appeal Brief"); (2) the Examiner's Answer mailed October 31, 2007 ("the Answer"); and (3) the Reply Brief filed December 31, 2007 ("the Reply Brief").

Appellants' Invention

Appellants invented a method, system, and article of manufacture for identifying a mean item from a group of items. The method and system separate the items into clusters, computes the variance of the cluster, and selects a mean item. The article of manufacture's code embodied on computer readable medium also performs these steps.[8]

Independent claims 1, 14, 19, and 20 are reproduced below:

1. A method for identifying one or more mean items for a plurality of items, J, each of the items having a symbolic value of a symbolic attribute, the method comprising:

    computing a variance of the symbolic values of the plurality of items relative to the symbolic value of each of the items; and

    selecting at least one mean item that has the symbolic value that minimizes the variance.

14. A system for identifying one or more mean items for a plurality of items, J, each of the items having at least one symbolic attribute having a symbolic value, the system comprising:

    a memory for storing computer readable code; and

    a processor operatively coupled to the memory, the processor configured to:

        compute a variance of the symbolic values of the plurality of items relative to each of the items; and

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[8] *See generally* Spec. 4:4-10 and 13:4–14:8.

select the at least one mean item having a symbolic value that minimizes the variance.

19. An article of manufacture for identifying one or more mean items for a plurality of items, J, each of the items having at least one symbolic attribute having a symbolic value, comprising:

a computer readable medium having computer readable [program] code embodied thereon, the computer readable program code comprising:[9]

a step to compute a variance of the symbolic values of the plurality of items relative to the symbolic value of each of the items; and

a step to select at least one item that has the symbolic value that minimizes the variance.

20. A system for identifying one or more mean items for a plurality of items, J, each of the items having at least one symbolic attribute having a symbolic value, the system comprising:

means for computing a variance of the symbolic values of the plurality of items relative to the symbolic value of each of the items; and

means for selecting at least one item that has the symbolic value that minimizes the variance.

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[9] We find that the phrase "computer readable code" in this paragraph is merely a typographical error in light of the term "computer readable program code" also recited in this paragraph.

(1) The Examiner rejected claims 1, 3-9, 11-14, and 16-23 under 35 U.S.C. § 101 as being directed to nonstatutory subject matter. Ans. 3.

(2) The Examiner rejected claims 1, 3-7, 9, 11, 12, 14, 16, 17, and 19-23 under 35 U.S.C. § 102(b) as being anticipated by Chislenko. Ans. 4-7.

(3) The Examiner rejected claims 8, 13, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Chislenko and Keyes. Ans. 7-8.

I. THE NONSTATUTORY SUBJECT MATTER REJECTION

The Examiner rejected claims 1, 3-9, 11-14, and 16-23 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. We group the claims as follows:

(1) method claims 1, 3-9, 11-13, and 21-23;

(2) system claims 14 and 16-18;

(3) article of manufacture claim 19; and

(4) "means-plus-function" system claim 20.

A. *Claims 1, 3-9, 11-13, and 21-23*

The Examiner finds that representative independent claim 1[10] recites a mathematical algorithm that falls into one of the judicially-created

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[10] Appellants have not argued independent claim 9 separately from independent claim 1 (App. Br. 7-8; Reply Br. 2-3). Dependent claims 3-8, 11-13, and 21-23 have also not been argued with any particularity. *See id.* Accordingly, we group these claims together and select independent claim 1 as representative. 37 C.F.R. § 41.37(c)(1)(vii).

exceptions to patentable subject matter under § 101. Ans. 3. The Examiner also finds that the claim preempts substantially every practical application of the algorithm. *Id.*

Appellants assert that claim 1 does not cover every application and recites "specific limitations for characterizing the group, including computing an intra-group variance relative to a symbolic value of each item in the group, and identifying a stereotypical member (mean item) of the group based on the intra-group variance associated with each member." App. Br. 8.

<div align="center">ISSUE</div>

Have the Appellants shown that the Examiner erred in finding the method recited in claim 1 is not patent-eligible subject matter under § 101?

<div align="center">FINDINGS OF FACT</div>

The record supports the following findings of fact (FF) by a preponderance of the evidence:

      1.   Claim 1 recites a "method for identifying one or more mean items for a plurality of items, J." (Claim 1, l. 1).

      2.   Each claimed item has a symbolic value of a symbolic attribute. (Claim 1, l. 2).

      3.   The method of claim 1 comprises two steps.

      4.   The claimed method includes the step of computing (e.g., 520) a variance (e.g., $Var(J)$), of the symbolic values (e.g., x_i) of the plurality of items relative to the symbolic value of each of the items in

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the group or cluster. The variance can be calculated using an
equation. (Spec. 13:15-20 and 23-26; Fig. 5).

     5.   The claimed method also includes the step of selecting
(e.g., 530) a mean item that has the symbolic value (e.g., x_u) that
minimizes the variance. (Spec. 13:9, 10, 26, and 27; Fig. 5).

PRINCIPLES OF LAW

Section 101 of the Title 35 of the United States Code states:

> Whoever invents or discovers any new and useful process, machine,
> manufacture, or composition of matter, or any new and useful
> improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

35 U.S.C. § 101 (2002).

"[A]n applicant may show that a process claim satisfies § 101 either
by showing that his claim is tied to a particular machine, or by showing that
his claim transforms an article" into a different state or thing. *Bilski*, 545
F.3d at 961; *see also Benson*, 409 U.S. at 70.

ANALYSIS

Claim 1 recites a method for identifying a mean item for a group of
items (FF 1) and is not directed to a machine, manufacture, or composition
of matter as set forth in 35 U.S.C. § 101. Our analysis for claim 1 will
therefore focus on whether the claim recites a patent-eligible process under
§ 101. A process claim satisfies § 101 if it: (1) is tied to a particular
machine, or (2) transforms an article into a different state or thing. *Bilski,*

545 F.3d at 961. Accordingly, we apply each prong of this machine-or-transformation test to claim 1.

Bilski – Machine Prong

Claim 1 is not limited to any machine—let alone a particular machine. *See* FF 1, 2, 4, and 5. "[A] machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." *In re Ferguson*, 558 F.3d 1359, 1364 (Fed. Cir. 2009) (quoting *In re Nuijten*, 500 F.3d 1346, 1355 (Fed. Cir. 2007) (internal quotation marks omitted), *reh'g denied en banc*, 515 F.3d 1361 (Fed. Cir. 2008), and *cert. denied*, 129 S. Ct. 70 (2008)). Claim 1 computes a variance and selects a mean item (FF 4 and 5) without tying these steps to any concrete parts, devices, or combinations of devices. In fact, one can compute the variance and select the mean item in one's mind. Such mental steps are patentably excluded under § 101. *See Benson*, 409 U.S at 67; *see also In re Comiskey*, 554 F.3d 967, 979 (Fed. Cir. 2009) ("[M]ental processes -- or processes of human thinking -- standing alone are not patentable even if they have practical application.") Thus, while we agree with Appellants that the method of claim 1 does not recite a law of nature (App. Br. 7; Reply Br. 2), we do not find claim 1 recites any machine, let alone a particular machine, under this prong of the machine-or-transformation test.

Bilski – Transformation Prong

Claim 1 recites a method for identifying a mean item of plural items. FF 1. The claimed items are not limited to either a particular item or a physical item. Rather, each item has a symbolic value of symbolic attribute. FF 2. These symbolic values are neither physical objects nor do they represent physical objects. These symbolic values are nothing more than abstract ideas. The variance and mean item are calculated from these abstract ideas (i.e., symbolic values) and may be determined using a mathematical formula. FF 4 and 5. Since the variance and mean are derived from abstract ideas (i.e., symbolic values), neither the variance nor the mean are physical objects or represent physical objects. Overall, the variance and mean are abstract ideas defined by the items' symbolic values (FF 2-5), and we therefore find claim 1 does not recite an article to transform.

The steps of computing a variance of the items' symbolic values and selecting a mean item (FF 4 and 5) in claim 1 also do not transform an article into a different state or thing. These steps compute the variance and select a mean item without operating on or transforming any underlying physical object that the data represents. In essence, the steps of claim 1 broadly recite a non-transformative process that fails to recite an article.

Lastly, the claimed method is not both (a) limited to a practical application of a fundamental principle to transform specific data, and (b) limited to a visual depiction that represents specific physical objects or substances. *See Bilski*, 545 F.3d at 962-63 (discussing the transformation of *In re Abele*, 684 F.2d 902 (CCPA 1982)).

For the foregoing reasons, claim 1 is not a patent-eligible "process" under § 101. Accordingly, we will sustain the rejection of representative

independent method claim 1 under § 101, and method claims 3-9, 11-13, and 21-23 which fall with claim 1.

B. Claims 14 and 16-18

The Examiner also finds the scope of system claims 14 and 16-18 encompasses the judicially-created mathematical algorithm exception to patent-eligible subject matter under 35 U.S.C. § 101 and preempts substantially all practical applications. Ans. 3. While we agree with the Examiner's conclusion that claims 14 and 16-18 are nonstatutory under 35 U.S.C. § 101, we reach our conclusion based on a different rationale. Therefore, we designate a new ground of rejection for claims 14 and 16-18.

NEW GROUND OF REJECTION UNDER 37 C.F.R. § 41.50(b)

Under 37 C.F.R. § 41.50(b), we enter the following new ground of rejection for claims 14 and 16-18 under § 101.

ADDITIONAL FINDINGS OF FACT

The record supports the following additional findings of fact (FF) by a preponderance of the evidence:

6.   Independent 14 recites a "system for identifying one or more mean items for a plurality of items, J." (Claim 14, l. 1).

7.   Each claimed item has a symbolic value of a symbolic attribute. (Claim 14, ll. 1 and 2).

8.   The claimed system includes a memory for storing computer readable code and a processor operatively coupled to the memory. (Claim 14, ll. 4 and 5).

9. Memory (e.g., 120) can be RAM and/or ROM. (Spec. 7:8; Fig. 1).

10. The processor (e.g., 115) is described as a central processing unit (CPU) of a personal computer. (Spec. 7:7-8; Fig. 1).

10A. Claim 14 further recites "the processor configured to: compute a variance of the symbolic values of the plurality of items relative to each of the items". (Claim 14, ll. 5-7).

11. According to the Specification, the claimed processor is configured to compute (e.g., step 520 of mean computation routine 500) a variance (e.g., Var(J)), of the symbolic values (e.g., x_i) of the plurality of items relative to each of the items. (Spec. 13:15-26; Fig. 5).

11A. The claimed computation in FF 11 is described in the Specification as:

$$\text{Var}(J) = \sum_{i \in J} \left(x_i - x_\mu \right)^2$$

where J is a cluster of television programs, x_i is a symbolic feature value for show i, and x_μ is a feature value from one of the television programs in J such that it minimizes Var(J). (Spec. 13:15, 17-20, 24, and 25).

11B. Independent claim 14 further recites "the processor configured to: . . . select the at least one mean item having a symbolic value that minimizes the variance." (Claim 14, ll. 8 and 9).

11C. According to the Specification, the claimed processor is also configured to select (e.g., step 530 of mean computation routine

500) a mean item that has a symbolic value (e.g., x_u) that minimizes the variance. (Spec. 13:9, 10, 26, and 27; Fig. 5).

ANALYSIS

(1) Introduction

Under § 101, four categories of subject matter are eligible for patent protection: (1) processes; (2) machines; (3) manufactures; and (4) compositions of matter. 35 U.S.C. § 101. While the scope of patentable subject matter encompassed by § 101 is "extremely broad" and intended to "include anything under the sun that is made by man," it is by no means unlimited. *Comiskey*, 554 F.3d at 977 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)) (internal quotation marks omitted). Thus, while we find that claim 14 is directed to the "machine" category in Section 101, this does not end the patent-eligibility analysis. *See Ferguson*, 558 F.3d at 1363.

Despite the apparent sweep of Section 101, the Supreme Court has held that certain categories of subject matter are not entitled to patent protection. *Benson*, 409 U.S. at 67. In the most recent case addressing Section 101, the Supreme Court explained that there are three categories of subject matter for which one may not obtain patent protection. These judicially-created exceptions are "laws of nature, natural phenomena, and abstract ideas." *Diehr*, 450 U.S. at 185. The Federal Circuit has further recognized that the Court's precedent suggests "the 'mathematical algorithm' exception [, an example of the abstract idea judicial exception,] applies to true apparatus claims." *Alappat*, 33 F.3d at 1542. Thus, the mathematical exception analysis used in "*Benson* . . . applies equally

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whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." *Id.* (quoting *In re Johnson*, 589 F.2d 1070, 1077 (CCPA 1978) (internal quotation marks omitted)).

If a claimed machine (or article of manufacture)[11] involves a mathematical algorithm, then we must determine whether the scope of the claimed invention encompasses one of the judicially-created exceptions. This determination of claim scope requires that we make two inquiries:

> (1) Is the claim limited to a tangible practical application, in which the mathematical algorithm is applied, that results in a real-world[12] use[13] (e.g., "not a mere field-of-use label having no significance")?[14]

> (2) Is the claim limited so as to not encompass substantially all practical applications of the mathematical algorithm[15] either "in all fields" of use of the algorithm or even in "only one field?"[16]

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[11] Notwithstanding the court's statement in *Nuijten*, 500 F.3d at 1356 n.7 ("We have never held that a *manufacture* is ever required to produce any result."), if an applicant chooses to claim the manufacture in terms of applying a mathematical algorithm (e.g., Appellants' claim 19), then this two-part inquiry applies to determine if the claim is directed to eligible subject matter under § 101.

[12] "Real-world" is not sufficient alone to establish patent-eligible subject matter absent tangibility. *See Nuijten*, 500 F.3d at 1356.

[13] *See Benson*, 409 U.S. at 68 (noting that the claim at issue was "so abstract and sweeping as to cover both known and unknown uses . . . .").

[14] *See Alappat,* 33 F.3d at 1544 (noting that the claim's recitation of "a rasterizer for creating a smooth waveform is not a mere field-of-use label having no significance.").

[15] *Benson*, 409 U.S. at 71-72.

If the machine (or article of manufacture) claim involves a mathematical algorithm and fails either prong of our two-part inquiry, then the claim is not directed to patent-eligible subject matter under § 101.

To illustrate this analysis more fully, we review the holdings of *Flook*,[17] *Benson*, *Diehr*, *Abele*, and *Meyer*.[18]

(2) Flook

The Court in *Flook* determined that the method claims at issue involved a mathematical algorithm and did not recite a patent-eligible invention. *Flook*, 437 U.S. at 594. The *Flook* Court found that the claims "cover a broad range of potential uses . . . ." *Id.* at 586; *see also Diehr*, 450 U.S. at 192 n.14. Thus, the claims did not recite a mathematical algorithm applied to a tangible practical application that resulted in *a real-world use*. Rather, the claims merely "covered all uses of the formula in processes 'comprising the catalytic chemical conversion of hydrocarbons.'" *See id.* As such, the recitation to "the catalytic chemical conversion of hydrocarbons" was no more than a technological field-of-use label. *See Alappat*, 33 F.3d at 1544.

The *Flook* Court also found that the claims "did not cover every conceivable application of the formula." *Diehr*, 450 U.S. at 192 n.14. But

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[16] *See Bilski*, 545 F.3d at 957 (citing *Diehr*, 450 U.S. at 193 n.14) ("[I]neligibility under § 101 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.'").
[17] *Parker v. Flook*, 437 U.S. 584 (1978).
[18] *In re Meyer*, 688 F.2d 789 (CCPA 1982).

since the claims encompassed substantially all practical applications of the mathematical algorithm in fields related to catalytic chemical conversion of hydrocarbons, the claims were patent ineligible. *Id.* The Court "rejected in *Flook* the argument that because all possible uses of the mathematical formula were not pre-empted, the claim should be eligible for patent protection." *Id.* Thus, the claims were not limited so as to avoid encompassing substantially all practical applications of the mathematical algorithm in a field of use.

(3) Benson

In *Benson*, the Court held that claims involving a mathematical algorithm and directed to a method for converting binary-coded-decimal (BCD) numerals into pure binary numerals for use with a computer were nonstatutory under § 101. In reaching this conclusion, the Court found:

> Here the 'process' claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus.

Benson, 409 U.S. at 68. Nonetheless, the claims were not limited to any of these possible end uses. Thus, the claims did not recite a tangible practical application, in which a mathematical algorithm was applied, that resulted in a real-world use.

The Court further noted that "[t]he mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the

patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Id.* at 71-72. Moreover, the Court found the claimed process had no other use except with a computer. *Id.* Thus, the claims in *Benson* encompassed substantially all practical applications of the mathematical algorithm.

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(4) Diehr

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In *Diehr*, the claimed invention involved a mathematical algorithm and was directed to a process for curing synthetic rubber. The Court held that a physical and chemical process for molding precision synthetic rubber products was statutory subject matter under § 101. *Diehr*, 450 U.S. at 192. In contrast to the facts in *Flook*, the Court held:

> [W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect . . ., then the claim satisfies the requirements of 101. . . . [W]e do not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial process for the molding of rubber products . . . .

Diehr, 450 U.S. at 192-93. Thus, the claim: (1) recited a mathematical algorithm applied to a tangible practical application that resulted in a real-world use, namely a particular physical industrial process for curing synthetic rubber, and (2) did not encompass substantially all practical applications of the mathematical algorithm.

(5) Abele and Meyer

The Court of Customs and Patent Appeals, the Federal Circuit's predecessor court, held unpatentable and the Federal Circuit recently reaffirmed a "broad independent claim reciting a process of graphically displaying variances of data from average values." *Bilski,* 545 F.3d at 962 (citing *Abele,* 684 F.2d at 909). Also, the Court of Customs and Patent Appeals held unpatentable and the Federal Circuit recently reaffirmed a "process claim involving undefined 'complex system' and indeterminate 'factors' drawn from unspecified 'testing' not patent-eligible." *Bilski,* 545 F.3d at 962 (citing *Meyer,* 688 F.2d at 792-93). Thus, a claim must be limited to a tangible practical application, in which the mathematical algorithm is applied, that results in a real-world use and be limited so as to not encompass substantially all practical applications of the mathematical algorithm.

(6) Discussion of Claim 14

Appellants' claim 14 recites a machine for identifying a mean item of plural items. Claim 14 recites a system used to identify a mean item for a plurality of items, each item having a symbolic attribute having a symbolic value. FF 6 and 7. Claim 14 also recites a processor configured to: compute a variance of the symbolic values of the plurality of items relative to each of the items; and select the at least one mean item having a symbolic value that minimizes the variance. FF 10A and 11B. The Specification describes this computation as a mathematical formula. FF 11A. Thus, claim 14 recites a

mathematical algorithm, and we must determine if the judicial exception
applies.

We must determine if claim 14 recites a practical application of the
mathematical algorithm. The claimed "items" and their corresponding
symbolic values of symbolic attributes are not limited to either a particular
or physical item or article. These exemplary items and their corresponding
symbolic values represent nothing more than abstract ideas and are not
physical objects or representative of physical objects.[19] Other than claim
14's recital of a memory and a processor (FF 8) for computing a
mathematical algorithm, we conclude that claim 14 fails to recite any
tangible practical application in which the mathematical algorithm is applied
that result in a real-world use. Rather, the claimed "identifying one or more
mean items" is akin to the "broad range of potential uses" found in *Flook*.
See Diehr, 450 U.S. at 192 n.14.

As a separate and independent inquiry, we will also determine if claim
14 is limited so as to not encompass substantially all practical applications of
the mathematical algorithm either in all fields of use of the algorithm or only
one field. Claim 14 recites a memory and a processor. FF 8. The memory
and processor clearly introduce structure into the claim. However, other
than providing examples of the memory as RAM and/or ROM (FF 9) and
the processor as a CPU for a personal computer (FF 10), the Specification

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[19] Claim 14 encompasses exemplary items (e.g., television programs) but is
not limited to any particular form of "item" either explicitly or implicitly.
Similarly, the claim's symbolic values are not limited to representing
channel or title values. *See* FF 3.

provides no more details about these devices and furthermore, the claim is not so limited to even these disclosed examples. According to the Specification, the claimed processor is configured to compute a variance of the symbolic values of the items relative to each of the items (FF 11) and to select the mean item having a symbolic value that minimizes the variance (FF 11C). The processor's ability to compute the variance involves calculating, using a mathematical formula (FF 4 and 11A) that includes the symbolic values or abstract ideas as variables. Additionally, the processor's ability to select a mean item from the symbolic value involves minimizing the variance (FF 11B and C) or an abstract idea. Based on the above discussion, claim 14 encompasses substantially all practical applications. That is we are unable to identify any other practical application outside of the broadly defined claim. The recited system's memory and processor (FF 8-10)—like *Benson's* re-entrant shift register[20]—in effect encompasses substantially all means. *See Benson*, 409 U.S. at 65. Thus, claim 14 forecloses others from using substantially all practical applications of the algorithm in substantially all fields of use.

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[20] Notably, claim 8 in *Benson* recited a reentrant shift register for storing binary coded decimal (BCD) signals in connection with the recited method that converted BCD signals to binary form. *See Benson*, 409 U.S. at 73-74 (listing claim 8 which recites, in pertinent part, "[t]he method of converting signals from binary coded decimal form into binary which comprises the steps of . . . storing the binary coded decimal signals *in a reentrant shift register*") (emphasis added). Nevertheless, the Court found this claim to be unpatentable under § 101. *Id.* at 71-72.

Furthermore, the "configured to" limitations of the processor in claim 14 (FF 10A, 11, 11B, and 11C) are not tied to the system's memory and, in effect, merely recite the processor's ability to compute a variance and select a mean item (i.e., both abstract ideas). *See* FF 2-5 and 10A-11C. The scope of the claim also includes using a mathematical formula to determine the variance. *See* FF 4 and 11A. Thus, by substantially encompassing all practical applications of the mathematical algorithm, the breadth of the claim wholly preempts the disclosed mathematical formula and, in essence, claims the algorithm itself. *See Benson,* 409 U.S. at 71-72. Furthermore, any other application of claim 14 is drawn to mere abstractions. *See* FF 6, 7, 11, and 11C. Claim 14 therefore does not recite statutory subject matter and is not directed to an eligible "machine" or "manufacture" under § 101.

Dependent claims 16-18 fail to cure the deficiencies of independent claim 14 and are rejected for the same reasons.

For the foregoing reasons, we conclude that claims 14 and 16-18 are nonstatutory under 35 U.S.C. § 101.

C. Claim 19

The Examiner rejected claim 19 under 35 U.S.C. § 101 as being directed to a patent-ineligible disembodied computer program. Ans. 3. Appellants argue that claim 19 recites an article of manufacture having a code embodied on a computer readable medium and is not a disembodied program. App. Br. 8.

ISSUE

Have Appellants shown that the Examiner erred in rejecting claim 19
by finding that the recited article of manufacture that includes a computer-
readable medium with code embodied on the medium does not constitute
statutory subject matter under § 101?

ADDITIONAL FINDINGS OF FACT

The record supports the additional following findings of fact (FF) by a
preponderance of the evidence.

        12.   Claim 19 recites an article of manufacture for identifying
a mean item for a number of items, each item having a symbolic value
of a symbolic attribute. (Claim 19, ll. 1-3).

        13.   Claim 19 includes computer readable program code
embodied on a computer readable medium. (Claim 19, ll. 4 and 5).

        14.   The claimed computer readable program code comprises
(a) a step to compute a variance of the symbolic values of the plurality
of items relative to the symbolic value of each of the items (e.g., 520),
and (b) a step to select a mean item that has the symbolic value that
minimizes the variance (e.g., 530). (Claim 19, ll. 4-9; Spec. 13:9, 10,
15-20, and 23-27; Fig. 5).

        15.   The Specification provides a non-limiting example of a
computer readable medium as "memory 120, such as RAM and/or
ROM." (Spec. 7:8; Fig. 1).

PRINCIPLES OF LAW

Even if a claim fits within one or more of the statutory categories under 35 U.S.C. § 101, the claim may not be patent-eligible. *Ferguson*, 558 F.3d at 1363.

"A 'manufacture' (in its verb form) is defined as the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." *Nuijten*, 500 F.3d at 1356 (citations and internal quotation marks omitted). "An 'article' is a particular substance or commodity. . . ." *Id.* (internal quotation marks omitted).

ANALYSIS

Claim 19 recites an article of manufacture for identifying a mean item of plural items. FF 12. The claimed article of manufacture includes computer-readable code embodied on a computer-readable medium (FF 13), and the code comprises a computation and selection step (FF 14). The Specification indicates that the computer-readable code is stored on computer-readable medium, such memory 120 that can be RAM and/or ROM. FF 15. Both RAM and ROM include hardware components of memory.

As these hardware components are tangible things, we find that the recited computer-readable medium of claim 19 fully comports with the definition of a "machine," namely "a concrete thing, consisting of parts, or of certain devices and combination of devices . . . . [that] includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." *Ferguson*,

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558 F.3d at 1364 (internal quotation marks omitted). We also find that the computer-readable medium of claim 19 fits within the "manufacture" category under § 101. *See* 35 U.S.C. § 101. "A 'manufacture' (in its verb form) is defined as the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery," *Nuijten*, 500 F.3d at 1356 (citations and internal quotation marks omitted), and "[a]n 'article' is a particular substance or commodity. . . ." *Id.* The computer readable media disclosed in the Specification (e.g., RAM and/or ROM (FF 15)) are memory elements, chips, or produced articles for use from materials that are given new forms, qualities, or properties by machinery.

Nevertheless, although claim 19 is directed to a machine or an article of manufacture, that alone is not sufficient to determine if the claim recites statutory subject matter. *See Ferguson*, 558 F.3d at 1363. Accordingly, we must apply the two separate and independent inquiries discussed previously. First, the "step to compute" of claim 19 (FF 15) involves the same mathematical algorithm found in claim 14 (FF 10A-11A), and the "step to select" of claim 19 (FF 14) is identical to the select function perform in claim 14 (FF 11B and 11C).

Since the steps recited in claim 19 are identical to the functions found in claim 14, we refer to our previous discussion of claim 14 and conclude that claim 19 similarly fails to recite the application of a mathematical algorithm to a tangible practical application that results in a real-world use. Second, using the same rationale applied to claim 14, claim 19 encompasses substantially all practical applications of the mathematical algorithm (e.g., computer applications) in substantially all fields of use. Therefore, our

statutory subject matter analysis of combination claim 14 is equally applicable to sub-combination claim 19. We therefore conclude that the article of manufacture or machine recited in claim 19 is not patent-eligible under § 101.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of claim 19 under § 101. Therefore, we will sustain the Examiner's rejection of that claim in light of our rationale noted above which we designate as a new ground of rejection.

D. Claim 20
i. 35 U.S.C. § 101

For the reasons discussed below, we will not reach the merits of the rejection of claim 20 under 35 U.S.C. § 101. Rather, we reverse this rejection as a matter of form and enter a new ground of rejection *infra*.

ii. New Ground of Rejection - 35 U.S.C. § 112, Second Paragraph

We enter a new ground of rejection under 37 C.F.R. §41.50(b) for claim 20. Claim 20 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

ADDITIONAL FINDINGS OF FACT

The record supports the additional following findings of fact (FF) by a preponderance of the evidence.

> 16. Claim 20 recites a system for identifying a mean item for a number of items, each item having a symbolic value of a symbolic attribute. (Claim 20, ll. 1 and 2).

17. Claim 20 includes: (a) a means for computing a variance of the symbolic values of the plurality of items relative to the symbolic value of each of the items (e.g., 520) and (b) a means for selecting a mean item that has the symbolic value that minimizes the variance (e.g., 530). (Claim 20, ll. 4-7; Spec. 13:9, 10, 15-20, and 23-27; Fig. 5).

PRINCIPLES OF LAW

When a claim uses "means for" language, there is a presumption that the claim invokes 35 U.S.C. § 112, ¶ 6. *See Biomedino L.L.C. v. Waters Techs. Corp.*, 490 F.3d 946, 950 (Fed. Cir. 2007). Such means-plus-function limitations cover corresponding structure described in the specification and its equivalents. *In re Donaldson*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc). However, "[a]n element of a claim described as means for performing a function, if read literally, would encompass any means for performing the function . . . . But *section* 112 para. 6 operates to cut back on the types of *means* which could literally satisfy the claim language." *Johnson v. IVAC Corp.*, 885 F.2d 1574, 1580 (Fed. Cir. 1989) (emphasis in original) (citations omitted).

The test for definiteness under 35 U.S.C. § 112, second paragraph is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs*, 806 F.2d 1565, 1576 (Fed. Cir. 1986) (citations omitted). In the context of a means-plus-function limitation, if one skilled in the art would be able to identify the structure, material, or acts for performing the claimed function, then the requirements of 35 U.S.C. § 112, second

paragraph are satisfied. *See Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381 (Fed. Cir. 1999); *see also In re Dossel*, 115 F.3d 942, 946-47 (Fed. Cir. 1997). If there is insufficient disclosure of the structure, material, or acts for performing the claimed function, however, a rejection under 35 U.S.C. § 112, second paragraph is appropriate. *See Donaldson*, 16 F.3d at 1195; *Biomedino*, 490 F.3d at 952.

ANALYSIS

We note that neither Appellants nor the Examiner indicates whether the "means for" language in claim 20 invokes 35 U.S.C. § 112, ¶ 6. Nevertheless, we find that § 112, ¶ 6 has been invoked with respect to claim 20 for the limitations, "means for computing a variance of the symbolic values of the plurality of items relative to the symbolic value of each of the items" and "means for selecting at least one item that has the symbolic value that minimizes the variance." *See* FF 17. That is, each of these limitations uses the phrase, "means for," which is modified by functional language (e.g., computing or selecting) and each of the "means for" phrases is not modified by sufficient structure to perform the recited function.

Claim 20 recites a system with two means: (1) a means for computing a variance of the symbolic values of a plurality of items relative to the symbolic value of each item and a means, and (2) a means for selecting an item that has a symbolic value that minimizes the variance. FF 16 and 17. The corresponding structure for the means for computing the variance involves a processor (e.g., 115) in conjunction with memory (e.g., 120) that performs the mean computation routine 500 (FF 4 and 9, 10, 11, 11A, and 11C). The mean computing routine or algorithm 500 includes computing

the variance of the symbolic values of the items (*see* FF 4, 11, 11A, and 17) and selecting the item that has the symbolic value that minimizes the variance (*see* FF 5, 11C, and 17). Additionally, as explained above in connection with claim 14, the combined processor and memory are tantamount to a general-purpose computer. However, as set forth in *Aristocrat*, 521 F.3d at 1333, the corresponding structure of the means-plus-function limitation in a claim must be more than simply a general-purpose computer or microprocessor to avoid pure functional claiming.

"Because general purpose computers can be programmed to perform very different tasks in very different ways, simply disclosing a computer as the structure designated to perform a particular function does not limit the scope of the claim to 'the corresponding structure, material, or acts' that perform the function, as required by *section 112* paragraph 6." *Aristocrat*, 521 F.3d at 1333. Moreover, "[f]or computer-implemented means-plus-function claims where the disclosed structure is a computer programmed to implement an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." *Finisar Corp. v. The DirectTV Group*, 523 F.3d 1323, 1340 (Fed. Cir. 2008) (citations and internal quotation marks omitted). As such, the application must disclose "enough of an algorithm to provide the necessary structure under *§ 112, ¶ 6*" or a disclosure that can be expressed in any understandable terms (e.g., a mathematical formula, in prose, or as a flowchart). *Id.* But "[s]imply reciting 'software' without providing some detail about the means to accomplish the function is not enough." *Id.* at 1341-42.

In this case and as discussed previously, the structure described in the Specification that corresponds to the means-plus-function limitations in claim 20 is nothing more than a general-purpose computer that computes a variance and selects an item that minimizes the variance. *See* FF 9, 10, 11, 11C, and 17. Thus, the Specification does not provide adequate corresponding structure or limit the scope of the claim to corresponding structure that performs the function as required by § 112, sixth paragraph. Additionally, while the Specification describes a formula for calculating a variance of symbolic values (FF 4 and 11C), there are few details of the algorithm or process for selecting the item that minimizes the variance. *See* FF 5, 11C, and 17.

Because we cannot determine the metes and bounds of claim 20 due to these defects, the claim is indefinite. Additionally, we will not reach the merits of whether claim 20 is patent-eligible under 35 U.S.C. § 101 since we cannot determine the scope of claim 20.

II. THE PRIOR ART REJECTIONS

Claims 1, 3-7, 9, 11, 12, 14, 16, 17, and 19-23 are rejected under 35 U.S.C. § 102(b) as being anticipated by Chislenko. Ans. 4-7. Claims 8, 13, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chislenko and Keyes. Ans. 7-8.

As to these prior art rejections, our decision is dispositive with respect to patentability since (1) claims 1, 3-9, 11-14, 16-19, and 21-23 on appeal do not recite patent-eligible subject matter under § 101, and (2) we cannot determine the scope of claim 20. We therefore need not reach the question of whether claims 1, 3-7, 9, 11, 12, 14, 16, 17, and 19-23 would have been

anticipated under § 102 and claims 8, 13, and 18 would have been obvious under § 103. *See Diehr*, 450 U.S. at 188; *Comiskey*, 554 F.3d at 973 (declining to reach obviousness rejection on appeal after concluding many claims were nonstatutory under § 101); *Bilski,* 545 F.3d at 951 n.1 (noting that § 101 is a threshold requirement and that Examiner may reject claims solely on that basis); *In re Rice*, 132 F.2d 140, 141 (CCPA 1942) (finding it unnecessary to reach rejection based on prior art after concluding claims were directed to nonstatutory subject matter). *See also In re Steele*, 305 F.2d 859, 862 (CCPA 1962) (supporting not presenting an art rejection when considerable speculation into the scope of the claim is required).

CONCLUSIONS OF LAW

(1) Appellants have not shown that the Examiner erred in rejecting claims 1, 3-9, 11-14, 16-19, and 21-23 as being directed to nonstatutory subject matter under 35 U.S.C. § 101.

(2) We reverse the rejection of claim 20 under 35 U.S.C. § 101 and enter a new ground of rejection for claim 20 under 35 U.S.C. § 112, second paragraph.

ORDER

The decision of the Examiner to reject claims 1, 3-9, 11-14, 16-19, and 21-23 as being directed to patent-ineligible subject matter is affirmed.

We reverse the rejection of claim 20 under 35 U.S.C. § 101.

We enter new grounds of rejection under 37 C.F.R. § 41.50(b) for claims 14 and 16-20.

This decision contains new grounds of rejection pursuant to 37 C.F.R. § 41.50(b). This section provides that "[a] new ground of rejection... shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new grounds of rejection to avoid termination of the appeal as to the rejected claims:

> (1) Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

> (2) Request that the proceeding be reheard under § 41.52 by the Board upon the same record . . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

<u>AFFIRMED-IN-PART</u>
<u>37 C.F.R. § 41.50(b)</u>

ELD

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